CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

In the previous chapter, most of the research previously done on legibility has been explored. Most of the experimental methods applied to legibility research were presented and the results from the experiment also recommendation from existing guidelines are collected and tabulated. Based on the previous chapter, it has been shown that a gap still exists on developing legibility guideline since VDT resolution is yet to be fully explored on its influence in affecting legibility of text on web pages. Is this chapter, the methodology used in achieving the first and main objective layout in this research will be presented. Achieving the first objective, this chapter will start by introducing the design of the experiment that will explain the detail about subjects selection, experimental apparatus and the setup, and all the dependant variables. Following this, the experimental method, including the test method and how the legibility is measured will be explained. The method for validating the experiment will be present next, followed by detail presentation on the criteria that had been considered in creating the proposed LG. Lastly, the second objective of a general architecture and LAT creation will be presented.

3.2 EXPERIMENT DESIGN

To achieve the first objective, this section and all subsequent sections and sub-sections will present all aspects of experimental design. This chapter will start by explaining the subjects or the participant criteria that involved in this research experiment. Presenting the apparatus used in the experiments will then follow. Based on

the scope of this research, typeface, font size, the colour combination and the colour contrast ratio selected will be presented. Following this, the experimental method that will explain in detail on how the legibility will actually be evaluated and measured will be presented. Next, the technique used in validating the results will be also presented. Lastly, for reporting purposes, the analysis method used and the structure of the newly constructed guideline will be also presented.

3.2.1 Subjects

All subjects were recruited randomly from the student population at Politeknik Sultan Haji Ahmad Shah (POLISAS). Below are the criteria of the subjects used in this research experiment:

i. Age group: 18-32 years
ii. Normal vision or corrected to normal vision.
iii. Know how to and are used to browsing the Internet.

All subjects were sure to have no class or activity for the next two hours, to ensure they were not rushing or pressure to complete the experiments due to a tight timeline.

3.2.2 Display Instruments and Resolution Used

To ensure the accuracy of the experiments, a set of single model displays or VDT were used. Below are the specifications of the VDT:

i. VDT type: Liquid Crystal Display (LCD)
ii. VDT model: ThinkVision L2440p
iii. VDT viewable image size: 24-inch

To see the effects of resolution, two resolutions sizes were chosen in this experiment. Table 3.1 shows the two resolutions used and their pixels per inch (PPI). The PPI calculation is based on Equations 3.1 and 3.2 below:

To calculate the PPI takes two steps:

i. Calculate diagonal resolution in pixels using Pythagorean theorem:

$$d_p = \sqrt{w_p^2 + h_p^2} \tag{3.1}$$

ii. Calculate the PPI:

$$PPI = \frac{d_p}{d_i} \tag{3.2}$$

Where:

i. d_p is diagonal resolution in pixels
ii. w_p is width resolution in pixels
iii. h_p is height resolution in pixels
iv. d_i is diagonal size in inches

Table 3.1: Resolutions used in the experiments

	Resolution		**Monitor Size (d_i)**	**Pixel per inch (PPI)**	**Pixel per square inch (PPI^2)**
	Width (w_p)	**Height (h_p)**			
High	1920	1080	24-inch	91.79	8425
Low	1280	1024	24-inch	68.30	4664.89

Based in Table 3.1, two resolutions chose is 1920x1080, and 1280x1024. Both will be used on the same sets of VDT with 24-inch in size. To see the effects of any legibility improvement, the PPI^2 value for high resolution has almost double compared to low resolution.